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QUESTIONS RELATIVE TO THE BARBERRY ERADICATION
CAMPAIGN THAT EVERY FIELD MAN SHOULD BE ABLE TO
ANSWER FULLY

IDENTIFICATION OF BARBERRIES

1. (a) Draw a sketch of leaves, branches, flower clusters, and berries showing the distinguishing characters of Berberis vulgaris.
(b) Draw a sketch of leaves, branches, flowers, and berries showing the distinguishing characters of Berberis thunbergii.
(c) What color are the blossoms on common and Japanese barberries? When do the blossoms appear?
(d) What shape are the berries of the common barberry? The Japanese barberry? How many seeds in each? What shape are the seeds?
(e) Describe the root system of a common barberry.
(f) What are stolons? How do they function? Of what importance are they in eradication?
(g) What color is characteristic of the inner bark of the Berberis species? What is the characteristic color of the roots?
2. (a) What is a hybrid barberry? How is a hybrid produced?
(b) What procedure would you follow if you found what you thought was a hybrid barberry? Would you rely on your own opinion as to its being a hybrid? Would you condemn it? Suggest greenhouse tests that could be made to verify your decision.
(c) Can the seed of hybrid barberry bushes produce susceptible barberries?
3. (a) How can you determine the age of a planted barberry bush? An escaped barberry bush? A barberry sprout? A barberry seedling?
(b) At what age will an escaped bush produce seeds?

DISTRIBUTION

4. (a) Is the distribution of barberries related in any way to the migration of settlers?
(b) From and to what parts of the United States is barberry distribution most evident?
(c) Is it traceable to the operations of nursery salesmen or landscape gardeners?
(d) Is Berberis vulgaris native to North America? To your State?
(e) Has Berberis canadensis been found in its natural habitat in your State? Has it been found in any of the Barberry Eradication States? Is it susceptible to black stem rust?
(f) Has any other native Berberis been found in your State?
5. (a) What is the relation of Odostemon (Mahonia) to Berberis? Name species of the genus Odostemon that may be found in the United States. What native Odostemon species grow in your State?
(b) Does Odostemon rust in your State? What are the known susceptible varieties of Odostemon?

STEM RUST

Causal Organism and Hosts

6. (a) What organism causes stem rust? Where does it belong in the classification of fungi? Give in detail the life cycle of stem rust. Make detailed drawings.
(b) Which barberries are susceptible to black stem rust?
(c) What scientist first established the proof of the relationship between barberries and stem rust?
7. What organism causes leaf rust? What is its classification? How is it identified in the field?
8. (a) Give characters by which Puccinia graminis may be identified under field conditions.
(b) Make drawings of the spores which are typical of the different seasons.
9. Is the rust on timothy the same as black stem rust? Is it dependent upon the barberry? Does it go to cereals or other grasses?
10. (a) What is meant by a specialized (physiologic) form?
(b) How many such forms are there? Name common hosts for each.
(c) Are these forms subdivided? If so, which has the greater number of subdivisions?
11. (a) Name at least 10 hosts of stem rust.
(b) Name some common grass hosts with their general distribution.
(c) What part do native susceptible grass hosts play in the dissemination of stem rust in your State?
12. In what geographic areas does stem rust apparently overwinter in the uredinial stage?
13. (a) Is there any possibility that stem rust may overwinter in the red or uredinial stage in your State?
(b) If so, where, and give in detail the conditions favorable.
(c) What conditions are extremely unfavorable for urediniospore overwintering?
(d) What are the probabilities concerning the overwintering of the rust fungus as mycelium within wheat plants where winter wheat is grown?
14. What is the danger of infection from the north or south in your State?
15. (a) By what term is stem-rust infection on the barberry designated?
(b) At what time of the year would you expect to find the first aecia, or cluster-cups?

- (c) How soon after the opening of the aecia would you expect to find the first rust pustules on grains and grasses?
 - (d) Could a general epidemic of stem rust develop in any considerable barberry-free area, say a block of three counties, in your State?
 - (e) Does this depend upon locality or weather conditions or both?
16. (a) Does Berberis vulgaris at any time during the season cease to be a factor in continuing the spread of stem rust?
- (b) How far has stem rust been definitely traced from barberry bushes in your State?
- (c) How high in the air have stem-rust spores been found?
17. Give the details for making a local epidemiology study. Illustrate by maps.
18. (a) What are the two fundamental methods of control of stem rust?
- (b) Are both methods being used at the present time? Which method seems the more permanent? Why?
19. (a) What does a farmer mean by the term "rust year"?
- (b) Outline the weather conditions of a season which would be highly favorable for stem-rust development.
- (c) Outline the weather conditions of a season which is unfavorable for rust development.
- (d) Give reasons why stem-rust damage is usually local in some States and widespread in others.
20. (a) How does topography of the land influence the development of stem rust?
- (b) Would you repeat the survey of an area in which you had found a local epidemic of stem rust, regardless of the fact that you may have just scouted it and found the bushes?

SURVEYS FOR THE ERADICATION OF COMMON BARBERRIES

First Survey

21. What is a first survey? A farm-to-farm survey? A city survey?
22. (a) Give a detailed plan of organization and procedure for the beginning of a county survey; the completion of a county survey.
- (b) What plan should be followed to insure that no properties are missed along county and State lines?
23. Explain in detail how a first farm-to-farm survey is made. Should every house be visited and every property owner interviewed? How carefully and to what extent should the farmstead be inspected?
24. Explain in detail how a first city survey is made. How much of the suburbs of a city should be worked to insure that the rural survey and the city survey will not overlap?

25. (a) What are the possibilities for the occurrence of barberries on the premises about an abandoned house or an old building site?
(b) Should an abandoned road or lane be explored?
26. Suppose fruiting bushes of the common barberry were found in a farmyard - where might you expect to find escaped bushes?
27. How far from the mother bush and to what type of country are barberry seeds carried?
(a) What are the agencies contributing to the spread of barberries?
(b) Where might one expect to find barberry seedlings?
28. How long do you think the barberry seeds can remain in or on the ground and still produce seedlings under favorable conditions?
29. Give details for mapping an area of escaped bushes and seedlings.
30. If you found an almost inaccessible, wooded area infested with common barberries, what method would you recommend for finding and destroying these bushes?
31. What are the precautions to be taken when surveying stream banks, fence rows, wooded hillsides, wooded pastures, thickets, and swampy ground?
32. How far from fruiting bushes should a careful search for seedlings be made?

Second Survey

33. (a) What is a second survey? How does it differ from a first survey? Does it include both city and rural survey?
(b) What explanation would you give for the necessity of a second survey?
34. How may information gained on the first survey aid in the second survey?

Resurvey

35. How does resurvey differ from the first survey and the second survey?
36. Discuss the resurvey problem.
 - (a) What properties should be revisited? How often? When?
 - (b) Should resurveyed properties be searched for seedlings? missed bushes?
 - (c) If seedlings are found, how many adjacent properties should be scouted?
 - (d) If you discovered and destroyed all visible seedlings in a given area this summer, would you revisit the area next summer? Why?

37. How many resurveys may be necessary where fruiting bushes were found on the first survey? (Discuss with reference to the distribution, viability, and germination of barberry seeds.)
38. What precautions should be taken when resurveying an area and especially a property on which seedlings and seedling bushes were found on the first survey?
39. Explain in detail the precautions you would observe in resurveying any area where fruiting bushes, but not seedlings, had been found.
40. What methods can be used on resurvey in locating barberries that may have escaped observation on previous surveys?

ERADICATION

Mechanical

41. What methods of eradication have been used in the past?
42. What is the best way to destroy a single bush in a lawn? A small hedge between two city lots? Why?
43. What methods may be applied to large hedges in the country?
44. (a) Recommend methods of eradication for bushes in loose soil, rocky or stony ground, in heavy clay, in underbrush and shrubbery.
(b) As a general practice, would you recommend mechanical methods of eradication? Give reasons, economic and otherwise.
45. Describe in detail the method of digging a small bush; a large bush. Describe the use of horses in pulling bushes; the use of tractors.
46. Describe the proper way to attach a chain to a bush when using a crowbar to aid in pulling.

Chemical

47. What chemicals are recommended at present for use in destroying common barberries? Why was the use of sodium arsenite discontinued? Does chemical treatment dispense with the necessity of resurvey?
48. (a) When salt is used, what kind should be used and how should it be applied?
(b) How much salt would it be necessary to use on a bush 1 foot across at the surface of the ground? Eighteen inches? How much salt would you apply to a bush of three small stems? How much to a clump of bushes 10 feet in diameter? What is the smallest quantity necessary to kill even a very small bush?

- (c) Would you let the bush stand or cut it off? Why? At what times of the year may salt be most effectively and economically applied? What difference does soil make in the effectiveness of salt?
 - (d) Would the treatment be effective if livestock were allowed to run in the pasture and scatter or eat the salt? How would you prevent livestock from scattering salt? From eating it?
 - (e) Is there any danger to livestock or poultry as a result of chemical eradication with salt? How can this danger be reduced to a minimum? What would you do if cattle must run in a pasture where escaped barberries have been salted and it has not been possible to cover the salt?
 - (f) Should property owners be requested to furnish the salt?
- 49.
- (a) Has kerosene been used to kill barberries in your State?
 - (b) If kerosene is used, how can it best be applied?
 - (c) How much kerosene would be required to kill a bush 1 foot across at the surface of the ground? Eighteen inches? How much kerosene would you apply to a bush of three small stems? How much to a clump of bushes 10 feet in diameter? What is the minimum effective quantity for a very small bush?
 - (d) What effect would the kerosene treatment have on barberries if livestock were allowed to run in the pasture where the barberries were treated? Is kerosene in any way injurious to animals?
 - (e) State the time of year when kerosene may be applied most effectively. Is its action on barberries quicker than that of salt? Should bushes treated with kerosene be cut off or left standing?
 - (f) What are the comparative advantages and disadvantages of the salt and kerosene treatments?

PUBLICITY.

- 50.
- (a) Name three Federal Department publications dealing with stem rust and barberry eradication, giving their numbers.
 - (b) Name all of your State publications dealing with stem rust and barberry eradication, giving their numbers.
51. Prepare a short story that will give the essentials necessary to announce the arrival of a squad of barberry field agents in any given locality.
- (a) What sort of story or interview should be given for publication? What are the most important items to put into such publicity material? Explain the use of newspaper cuts and cartoons.
 - (b) Where would you place posters? Small demonstrations?

52. (a) With whom should you establish relations when first entering a county to begin a survey?
(b) Where can you get maps or other information about roads? What business men can be of assistance to you?
(c) Who do you think would be willing to give space for a window demonstration?
(d) Discuss procedure in organizing a field demonstration if you find a good local spread of rust from barberry.
(e) Are farm bureau picnics or similar gatherings good occasions for outdoor demonstrations? Why?
(f) What procedure would you follow in a community composed of foreign people who are unfamiliar with the English language?
53. With what civil officers would it be well to establish diplomatic relations when beginning work in a town or a county?
54. Suggest methods of interesting children in the campaign.

GENERAL

55. (a) When was the barberry eradication campaign in the United States first started? Name the 13 States cooperating.
(b) When was the barberry eradication campaign first started in your State?
(c) Briefly discuss the law in your State compelling the eradication of the common barberry. What is the effectiveness of such a law? Has it ever been necessary to use this law in compelling the removal of barberry bushes?
56. Give the numbers of barberry plantings and bushes found in your State. How many counties have been covered? How many counties are yet to be covered in the first survey in your State? Second survey? Resurvey?
57. In what parts of the eradication area have the greatest number of barberries been found?
58. (a) How long since nurserymen in your State discontinued the sale of common barberries?
(b) Why are barberries not removed in the South?
59. Give briefly the history of barberry eradication in Denmark, British Isles, France, Germany, Norway, Sweden, Austria, etc.
60. (a) What authority has a Federal field man to enter upon and inspect properties for barberries?
(b) Under whose authority can barberries be removed?
61. What statement will you make when a housewife asks you if you are going to replace the barberries you have removed?

62. What would you do in case an owner offered to cut off his barberry bushes or sprouts every week and thus prevent the possibility of an infection?
63. How may the State keep barberries out and be assured that all seedlings or missed bushes are destroyed?
64. Suggest a relatively cheap but effective means of finding the last harmful barberry in your State.
65. Why is it necessary to eradicate the common barberry even if a resistant variety of wheat is produced?
66. What are the indications in your State that barberry eradication will control stem rust? In neighboring States?
67. (a) What is the total acreage and production of all grains raised in your State during the past season? Of durum wheat? Of bread wheat?
(b) Name the principal bread wheat varieties grown in your State. Do the durums belong to this class?
68. (a) What is the estimated loss from stem rust in your State for each of the last ten years? What was the stem-rust loss last year?
(b) For the entire United States for the same period?
69. How would you answer a farmer who stated that the barberry field agent found a hedge of common barberry next to his wheat field and the stem rust was no worse in his field than in other wheat fields in the same neighborhood?
70. (a) Suppose a farmer says that he observed a great deal of black stem rust in your State long before any barberries were growing; how are you going to answer him?
(b) Explain why barberry bushes in close proximity to a grain field may be heavily rusted without rust occurring on the grain.
(c) How would you make your explanation of the development of stem rust agree with the statement that hot, muggy weather after several cool, dewy nights causes wheat to rust?
71. Is a common barberry bush growing in a level country more liable to spread rust over great distances than a bush growing in hilly, wooded country? Why?
72. What are you going to say when the property owner says, "There is no grain grown around here, so why take out the barberries?"
73. Outline the steps necessary to prove to a doubting farmer that common barberry is responsible for the initial spread of stem rust in the north-central grain-growing States.

74. What is the Conference for the Prevention of Grain Rust? What is its purpose? Where are its offices?
75. Discuss fully the responsibilities which a field man has to the institutions (Federal and State) which he represents relative to his conduct, thoroughness, honesty, friendliness, and sincerity.
76. Give a good method of approaching a farmer when making a survey. What is the best type of diplomacy - introducing your subject directly or indirectly?
77. (a) By means of a drawing locate the northwest quarter of the southwest quarter of Section 6. How many acres in a quarter of a section?
(b) How many square miles in a township? How many sections?
(c) What is the average number of townships in a county?
78. Suppose there are two sections numbered 10 in a township, and barberries are found in one of them. How are you going to designate which one on your report to the Office?
79. What precautions are necessary in reporting a new barberry planting? What information is absolutely essential?
80. What educational cooperative plan should be carried on in your State to advance public interest in the campaign?
81. How much does your State appropriate for the eradication of the common barberry?
82. How do you employ your time on rainy days?
82. When do you make out your expense accounts and reports?

RELATED PLANT DISEASE QUESTIONS THAT EVERY MAN IN

BARBERRY ERADICATION SHOULD BE ABLE TO ANSWER FULLY

(Note: As a rule, field assistants in barberry eradication should not discuss agricultural subjects or plant diseases other than those very closely related to barberry eradication. Persons asking for other information should be referred to the proper Federal or State agricultural authorities.)

1. Name and give distinguishing characteristics of the principal cereal diseases occurring in your State. Give latest approved control measures.
2. What are the dangers in the use of the concentrated formaldehyde method with wheat? What strength of solution would you recommend?
3. What is Bordeaux mixture? How made? For what type of disease used?

4. What is the lime-sulphur treatment? Copper carbonate treatment? For what plant diseases are they used?
5. Give the methods of potato seed treatment recommended in your State.
6. Give the life cycle and means of identification and control of cedar-apple rust.
7. Give the life cycle and means of identification and control of white-pine blister rust.
8. Name the hosts of fireblight. How is fireblight controlled?
9. What shrubs may be used to replace common and purple-leafed varieties of barberry? Are they alternate hosts of plant diseases?
10. What is the importance of reporting plant diseases to the plant pathologist at the State Agricultural College?